Heartland Network

National Park Service
U.S. Department of the Interior

Heartland Inventory and Monitoring Network

Fire Effects on Wildlife in Tallgrass Prairie

Importance: Affects more than plants

Ecologists point to fire as the primary disturbance that maintained the grassland ecosystem in tallgrass prairies of North America. Today, land managers use prescribed fire to simulate the wildland fires that historically occurred in this vegetation community. Prairie and fire ecologists promote burning on a rotational schedule to prevent encroachment of woody and invasive species of plants and to restore the prairie plant community.

Park managers and visitors express concern for effects of fire on wildlife. They want to know if wildlife can escape fire and secondly, they want to know the impact on wildlife habitat. Therefore, park managers depend on good science to determine best management practices in using fire.


Fox snake (*Elaphe vulpina*) in grass.

Monitoring an ecological process: Summarizing the documented impacts of fire[1]

The Heartland Inventory and Monitoring Network summarized the effects of fire on wildlife as documented in existing science literature. The areas of concern included the (1) ability of birds, mammals, reptiles, and amphibians to escape and survive fire, (2) effects of post-fire conditions on foraging behavior, and (3) species abilities to reproduce following fire. The resulting report answered the principal questions that resource managers and park visitors raise relative to the effects of prescribed fire and wildland fire on wildlife.

Effects of fire: Balancing immediate impacts and long-term effects

Scientists found that they can separate the effects of fire on wildlife into two categories: direct effects on the animals and indirect effects on animals through altered habitats. Many animals have evolved escape mechanisms. However, fire can pose a considerable threat to some wildlife, such as reptiles and amphibians or the very young of many species. Park managers should identify species within a proposed fire treatment area, and determine whether any species require special consideration during planning and fire treatment implementation. Additionally,


Red bat (*Lasiurus borealis*) roosting at Tallgrass Prairie National Preserve (picture courtesy of Darin McCullough).

1. Managers can design fire prescriptions to avoid direct wildlife mortality and to accommodate specific habitat needs by burning at times of the year when vulnerable animals are less susceptable, by avoiding critical habitats, and/or by burning only portions of the habitat in a single year.

2. Managers may accept some short-term shifts in wildlife species composition in order to maintain habitat and populations over the long-term.

3. Monitoring programs aimed at quantifying populations and fire effects for species of interest may also help fire programs adapt to help wildlife populations thrive.

Heartland Network Inventory and Monitoring Program of the National Park Service. Visit www.nps.gov/im/units/htln/index.htm

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Natural Resource Monitoring

[1] Gaetani, M. S., K. Cook, and S. A. Leis. 2010. Fire effects on wildlife in tallgrass prairie. Natural Resource Report NPS/HTLN/NRR—2010/193. National Park Service, Fort Collins, Colorado.